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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/941,827	08/29/2001	Ronald A. Weimer	MTI-31532	7551

31870 7590 06/04/2003

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EXAMINER

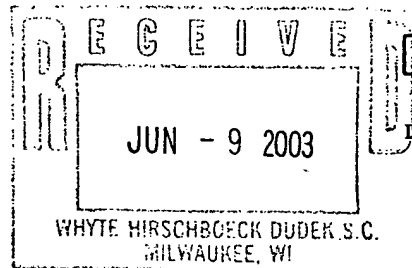
HUYNH, YENNHU B

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 06/04/2003



Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/941,827

Applicant(s)

WEIMER, RONALD I.A.

Examiner

Yennhu B Huynh

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 March 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-149 is/are pending in the application.
- 4a) Of the above claim(s) 1 and 7-149 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### **DETAILED ACTION**

This Office Action is in response to the Election filed on 3/25/03.

#### ***Election/Restrictions***

Applicant's election with traverse of claims 2-6 and 111-149 in Paper No. 11 is acknowledged. This is not found persuasive because the claims 1, 2-6, 111-149 and 7-110 are distinct species each other. They are related as species subcombination which shown to be separately usable. The distinct species have restricted in the last restriction requirement which including the species restriction of claims 111-149 (p.3).

The requirement is still deemed proper and is therefore made FINAL.

#### ***Claim Objections***

Claim 6 is objected to because of the following informalities:

In claim 6, line 1 the recited limitation -- the oxynitride-- should be changed to --the oxynitride layer-- . Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aronowitz et al. (U.S. 6,033,998) in view of Kim et al. (U.S. 5,46,4783).

Aronowitz et al. disclose a method of forming variable thickness gate dielectric, which include:

-Re. claims 2 & 3: annealing the polysilicon substrate to form an oxynitride, then nitridizing the oxynitride layer to form a nitride and depositing the dielectric layer onto the nitride layer (col. 2, lines 11-21, col. 4, lines 11-28, cols. 5 & 6 lines 58-28 and cols 6 & 7 lines 53-3, figs. 2A-2E), and wherein the annealing the substrate is at about 900C degrees (col.2, lines 11-21).

However, Aronowitz et al. do not disclose annealing the polysilicon at a temperature of less than 800 C degrees or at of about 700-750 C degrees.

Kim et al. in related art, disclose the polysilicon substrate annealing to form oxynitride at a temperature at of 800 C degrees (col.5, lines 1-4).

The concentrate, temperature, thickness and concentration are considered to involve routine optimization while has been held to be within the level of ordinary skill in the art, As noted In re Aller 105 USPQ233, 255 (CCPA 1955)., the selection of reaction parameters such as temperature and concentration would have been obvious.

"Normally, it is to expected that a change in temperature, or in range, concentration, cycles, thickness, would be an unpatentable modification. Under some circumstance, however, changes such as these may be impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art ... such ranges are termed "critical ranges and the applicant has the burden of proving such criticality ... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller 105 USPQ233, 255 (CCPA 1955). See also In re Waite 77 USPQ 586 (CCPA

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1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmischer 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).

Aronowitz et al. also do not disclose wherein the polysilicon layer comprises a polysilicon selected from the group of doped, undoped or HSG polysilicon (cl.4), and wherein oxynitride layer is about 40 angstroms or less than 15 angstroms thick (cls. 5 & 6).

Kim et al also disclose:

-Re. claim 4: wherein the polysilicon layer comprises a polysilicon selected from the group of doped (col.1, lines 28-32 and col.2, lines 62-66).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Aronowitz et al.' s invention by incorporating a doped polysilicon substrate, to let oxide react with the underlaying in order to reduce the overall dielectric constant and cell capacitance.

-Re. claims 5 & 6: wherein oxynitride layer is about 30-100 angstroms thick (col.5, lines 25,26).

The concentrate, temperature, thickness and concentration are considered to involve routine optimization while has been held to be within the level of ordinary skill in the art, As noted In re Aller 105 USPQ233, 255 (CCPA 1955)., the selection of reaction parameters such as temperature and concentration would have been obvious.

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"Normally, it is to expected that a change in temperature, or in range, concentration, cycles, thickness, would be an unpatentable modification. Under some circumstance, however, changes such as these may be impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art ... such ranges are termed "critical ranges and the applicant has the burden of proving such criticality ... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller 105 USPQ233, 255 (CCPA 1955). See also In re Waite 77 USPQ 586 (CCPA 1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmischer 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).

### ***Conclusion***

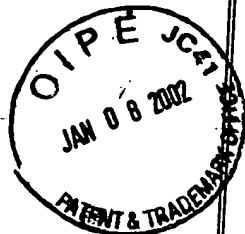
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yennhu Huynh whose telephone number is (703)308-6110. The examiner can normally be reached on Monday-Friday from 8:00 AM to 4.30PM.

If attempts to reach the examiner by telephone are unsuccessfully, the examiner's supervisor, Carl Whitehead, Jr., can be reached on (703) 308-4940. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

YNBH,  
5/28/03

  
CARL WHITEHEAD, JR.  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800



U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE Washington, D.C. 20231  <b>INFORMATION DISCLOSURE                  STATEMENT BY APPLICANT</b>	ATTY. DOCKET NO.	Serial No.
	MTI-31532	09/941,827
	Applicant	Confirmation No.
	Weimer, Ronald A.	7551
	Filing Date	Group Art Unit
	August 29, 2001	2812

**U.S. PATENT DOCUMENTS**

		Patent Number	Issue Date	Patentee	U.S. Class	Sub-Class	Filing Date
<i>yjt</i>	A1	5,634,974	06-03-97	Weimer et al.	117	103	11-03-95
	A2	5,688,550	11-18-97	Weimer et al.	427	8	12-15-95
	A3	5,759,262	06-02-98	Weimer et al.	117	88	04-02-97
	A4	5,962,065	10-5-99	Weimer et al.	427	8	09-03-97
	A5	6,087,229	07-11-00	Aronowitz et al.	438	287	03-09-98
	A6	6,124,164	09-26-00	Al-Shareef et al.	438	240	09-17-98
	A7	6,146,959	11-14-00	DeBoer et al.	438	393	06-15-98
	A8	6,162,744	12-19-00	Al-Shareef et al.	438	785	02-28-98
	A9	6,198,124	03-06-01	Sandhu et al.	257	310	05-28-98
	A10	6,207,587	03-27-01	Li et al.	438	769	06-24-97
	A11	6,218,256	04-17-01	Agarwal	438	393	04-13-99
	A12	6,235,571	05-22-01	Doan	438	240	03-31-99
	A13	6,245,652	06-12-01	Gardner et al.	438	592	06-21-00
<i>yjt</i>	A14	6,245,689	06-12-01	Hao et al.	438	769	09-08-98
	A15	6,291,868	09-18-01	Weimer et al.	257	413	02-26-98

**FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION**

Examiner Initial	Document Number	Publication Date	Country	Int'l Class	Sub-Class	Translation (Yes/No)
	B1					

**OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication)**

Examiner Initial	Non-Patent Document
	C1

Examiner Initials	<i>yjt</i>	Date Considered	<i>5/28/03</i>
EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.			

**Notice of References Cited**

Application/Control No.

09/941,827

Applicant(s)/Patent Under

Reexamination

WEIMER, RONALD A.

Examiner

Yennhu B Huynh

Art Unit

2813

Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5464783	11-1995	Kim et al.	437/42
	B	US-6033998	03-2000	Aronowitz et al.	438/786
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Handwritten signature and date: JH 6-0-03  
MPT-2K211